



Intel® Smart Sound Technology Driver

Release Notes: Tiger Lake Intel SST Release

February 2021

Revision 2.7

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Revision History

Revision Version	Revision History	Revision Date
0.5	• Intel® SST Tiger Lake Release 3223	December 2019
0.6	• Intel® SST Tiger Lake Release 3709	April 2020
0.7	• Intel® SST Tiger Lake Release 3769	April 2020
0.8	• Intel® SST Tiger Lake Release 3847	May 2020
0.9	• Intel® SST Tiger Lake Release 3947	May 2020
1.0	• Intel® SST Tiger Lake Release 4035	June 2020
1.1	• Intel® SST Tiger Lake Release 4058	June 2020
1.2	• Intel® SST Tiger Lake Release 4182	July 2020
1.3	• Intel® SST Tiger Lake Release 4196	July 2020
1.4	• Intel® SST Tiger Lake Release 4217	July 2020
1.5	• Intel® SST Tiger Lake Release 4274	July 2020
1.6	• Intel® SST Tiger Lake Release 4295	July 2020
1.7	• Intel® SST Tiger Lake Release 4382	August 2020
1.8	• Intel® SST Tiger Lake Release 4426	August 2020
1.9	• Intel® SST Tiger Lake Release 4479	September 2020
2.0	• Intel® SST Tiger Lake Release 4548	October 2020
2.1	• Intel® SST Tiger Lake Release 4648	October 2020
2.2	• Intel® SST Tiger Lake Release 4721	November 2020
2.3	• Intel® SST Tiger Lake Release 4767	November 2020
2.4	• Intel® SST Tiger Lake Release 4842	December, 2020
2.5	• Intel® SST Tiger Lake Release 4911	December, 2020
2.6	• Intel® SST Tiger Lake Release 5062	February, 2021
2.7	• Intel® SST Tiger Lake Release 5152	February, 2021

1 Introduction

1.1 Scope of Document

This document provides release information about the Intel® Smart Sound Technology (Intel® SST) Driver. It covers Release Kit summary, Important Notes, Known and Closed Issues.

This document is intended for OEMs and ODMs that are validating the Intel® Smart Sound Technology Driver on Tiger Lake (TGL) platforms with Intel Audio DSP integrated

1.2 System Requirements

Intel® Smart Sound Technology Driver supports the following Intel CPU/Chipset:

- Tiger Lake Processors

Platform Support:

- Tiger Lake processor-based platforms with Intel Audio DSP integrated

Operating Systems support:

- Microsoft Windows* 10 64-bit

1.3 Acronyms and Terminology

Term	Description
ACPI	Advanced Configuration and Power Interface
BIOS	Basis Input/output System
BT	Bluetooth

DMIC	Digital Microphone
DSP	Digital Signal Processor
EA	Enrollment Application
FDK	Firmware Development Kit
FW	Firmware
HDA or HD-Audio	High Definition Audio
HFP	Hands-Free Profile
IHV	Independent Hardware Vendor
ISV	Independent Software Vendor
Intel® SST	Intel® Smart Sound Technology
IPR	Ingredient Planned Release
TGL	Tiger Lake
LP	Low power
MCP	Multi-Chip Package
MCPS	Million Clocks Per Second
MCS	Modern Connected Standby Platform
Non-MCS	Non-Modern Connected Standby Platform
OED	Offload Engine Driver
OS	Operating System
PCH	Platforms Controller Hub
RVP	Reference Validation Platform
SUT	System under test
TBD	To be determined
ULT	Ultra-Thin
WOV	Wake on Voice.
PC	Production Candidate

PV	Production Version
PR	Planned Release
TH	Threshold
RS	Redstone
MR	Maintenance Release



2 *Release Kit Summary*

2.1 Release Kit

Kit Name: Intel® Smart Sound Technology Driver Tiger Lake Release

Supported OS: Windows* 10 64-bit

Version: 10.29.00.5152

2.2 Kit Contents

The contents of this release kit include:

- Drivers
 - DSP Firmware
 - Topology
 - WOV Artifacts
 - IntcAudiobus – Intel SST Audio Bus Driver for HD-A I/F
 - IntcOED – Intel SST Offload Engine Driver
 - Detection Verification Driver
 - Intel® DMIC driver
 - Intel® Bluetooth Audio Driver
 - Intel® USB Audio Driver
 - Intel® SST I2S Driver
- Module Version
 - Intel WOV version 2.0.730.20_476
 - Intel Audio Service version 01.00.1836.00
- Apps
 - Intel® Audio Service: Part of Intel SST OED Installation.
 - Intel MVA Extension package
- Intel® Smart Sound Technology Driver – Release Notes

3 *Intel® SST Release Details*

3.1 Intel® Smart Sound Technology Collaterals

Please refer to following Intel® SST collaterals for Intel® SST bring-up, validation and debug guidance.

Doc Number & Location	Doc Number & Location
Intel® Smart Sound Technology Driver - Bring-Up Guide	Included in every SST release package
Intel® Smart Sound Technology Customer - Validation and Debug Guide	Intel CDI Doc #575270

3.2 Platform Best Known Configuration

Please refer to Tiger Lake BKC Release.

3.3 Focused Testing Area

Please refer to the Intel® Smart Sound Technology Validation and Debug Guide on Intel® CDI (Document # 575270) for the test cases to test the following Intel® SST features.

For Desktop Processors:

- HD-Audio Playback
- HD-Audio Capture
- Digital Microphone Capture

For Mobile Processors:

- HD-Audio Playback
- HD-Audio Capture
- Digital Microphone Capture
- Intel® Wake on Voice - Contact Intel FAE or Intel® SST AE for more details.
- Post-processing - Contact Intel FAE or Intel® SST AE for more details.
- Pre-processing - Contact Intel FAE or Intel® SST AE for more details.



4 Intel® SST Release Highlights

Intel® SST Features		Highlights
Intel® Wake on Voice	WOVSetupApplication	Intel® WakeOnVoice Setup Application for Intel WOV IP supports: <ul style="list-style-type: none"> ○ Predefined Key Phrase on Win 10: Supported on Intel® WOV. Keyphrase is "Hello Computer".
	WOVClientApplication	<ul style="list-style-type: none"> ○ User Defined Key Phrase: Supported on Intel® WOV. ○ Speaker Verification: Supported on Intel® WoV
Intel® Audio Service	Intel® Audio Service	Intel® Audio Service installer is provided for to support Intel WOV via Intel Speech Pin
Intel® SST Post-Processing		Post processing IP ISVs will integrate their audio IP FW modules using the Intel audio FDK tool and provide their FW to the IHV's for final audio driver and FW integration for OEM customer platforms.
Intel® SST Pre-Processing	Intel Preprocessing IP	<p>Intel Preprocessing FW is included.</p> <p>Note: Pre-processing IP ISVs will integrate their audio IP FW modules using the Intel audio FDK tool and provide their FW to the IHV's for final audio driver and FW integration for OEM customer platforms.</p>
HD Audio Interface	NA	<p>HD Audio interface support has been implemented and included in CFL Intel® SST Release.</p> <p>Disclaimer: To test HD-A interface, a codec driver from audio codec vendor is required. Please contact your codec vendor to obtain the driver supporting this feature.</p>
I2S Interface	NA	<p>I2S Interface support has been implemented and included in the Release.</p> <p>Disclaimer: To test I2S interface, a codec driver from audio codec vendor is required. Please contact your codec vendor to obtain the driver supporting this feature.</p>
SoundWire Interface	NA	<p>SoundWire interface support has been implemented and included in CFL Intel® SST Release.</p> <p>Disclaimer: To test SoundWire interface, a sound wire driver from SoundWire device vendor is required. Please contact your sound wire device vendor to obtain the driver supporting this feature.</p>



5 *Important Notes:*

1. UAOL blacklist defined in IntcUSB.inf
HKR,GlobalSettings,UAOLBlackListedDevices,0x10000,VID_040D&PID_3401

6 *Known Issues*

Issue #	Description

7 Closed Issues

Sighting	Title	Fixed version
16012400729	OED YB during S3/S4 cycles	5152
16012540057	BSOD 0x133 during HDMI plug/unplug	5152
18014843683	[SDW] BSOD 7e caused by IntcOED during S4 cycles	5152
1508459415	Error while running Alexa Cert with jp-JP	5152
14013336425	USB Offload has pops and noise on USB Pre 2 Device output	5152
18013896908	(HLK)(USB)(TGL)(20H1)(RS5)- Kstopology test fail on KsProperty_Jack_Description	5152
1508785000	ACA DSP module name is only accepted as "dsp_lib_aca_module_release.bin"	5152
14013463065	[IADK 2.6.0 MR1]Intel IADK Logging in Simulator is not showing all log entries.	5152
14013319904	HD Audio Driver for Display Audio has two entries when using a single external monitor	5062
1508646491	No USB audio playback & recording endpoint while connect USB MR device(VR Helmet) with UAOL driver	5062
18014561234	Request IntelKeywordDetectorAdapter.log timestamp to support millisecond for latency check	5062
1508588229	ISST OED yellow bank when run warmboot stress	4911
1508600562	fix ADSP_INVALID_REQUEST related to I2S BT speaker	4911
1508588157	OED YB during Alexa testing	4911
1508556596	BSOD"SYSTEM_THREAD_EXCEPTION_NOT_HANDLED" when listening to music with headphones	4842
14012895331	Intel OED manual crash not letting endpoint discovery under SST bus controller. No issue during normal OED crashes.	4842
1508459200	The unit show Intel OED yellow ban on device manager when running hybridshutdown.	4842
18012072938	Topology name is inconsistent for USB offload and BT offload to install APO and processing	4842
22011627765	Audio glitches observed on speaker, headset endpoints during: <ol style="list-style-type: none"> 1. USB plug/un-plug 2. Volume level changes 3. Playback resume after system resume from S3/S4 	4767
22011514666	Display audio noise observed when playback Video/Audio with external monitor.	4767
18013257383	WOV&WHM update to ver. TGL FF 2.0.719.20_433	4721

18013360497	AEC integration, ver. FarField_1.0.0.82	4721
18012268874	post DVD restart rearming changes	4721
1508438635	BSOD 0x13A in PQC test of MV build	4648
14012734233	Silence observed over display audio after resuming the 30 seconds paused audio/video playback	4648
1508376865	[SDCA] force stereo readiness of SST	4611
22011474440	USB MIDI devices are not working due to USB audio offload feature in TGL	4611
14012586274	Video will lag when pause then resume.	4611
1307968345	BSOD BugCheck = 7E during S3 cycling (IntcOED.sys (IntcOED!soundwire::Cmd::ProceedTx+6)	4611
18013221620	[SDW] SNDWSYNC value was not updated in a waiting loop	4611
18012714457	[SDCA][PortClass] Endpoints not removed and audio system hangs after jack unplug	4611
1508289894	BSOD occurs during "System-PNP (disable and enable) with IO Before and After (Reliability)" test	4611
1508382654	[DMIC to codec] FRR fail issue at device playback item at 30/90 degree.	4611
14012462454	Audio noise during OOB Cortana speech scenario on the speaker endpoint	4548
22011200003	IntcUSB offload: recording file volume is too low with few USB Headset	4548
18011716065	No data on WOV reference for echo cancellation during speech application performance tests.	4548
1508289894	BSOD occurs during "System-PNP (disable and enable) with IO Before and After (Reliability)" test	4548
NA	SST driver fails SPTT exposing both v1DDI and v2DDI for DMIC connected to PCH case	4548
22011005285	WOV MPA Configuration with DMIC connected to codec: Cortana fails to respond to 'Hey Cortana' when WoV is enabled due to OEM DLL crash	4479
1508275157	BT device will YB and audio endpoint will lost after remove BT device	4479
1508255252	Video delay issue when replaying	4479
14011993070	Realtek Smart AMP I/V data stop working when playback music by Windows Media Player - W/A fix	4479
1508256437	system occur BSOD 0x7e when connect hook dock and plug in usb device then plug out usb device - review misc fixes	4479
1508181351	Hear periodically pop noise when pause and resume music for several times	4479
18012723519	restrict the path length to 90 characters starting from the production folder including the file name	4479
22010623680	playing file in the voice recorder, sometimes Oed will show DSP communication timeout and end point can't work	4479

1508283104	The audio icon shows Red X after pause video playing then switching the monitor mode or unplug HDMI cable under DC mode	4479
14012369729	[PM][SX][DPMO]: Yellow bang observed in Sound Wire Bus during S4 cycling	4479
14012368615	[PM][SX][DPMO]: INTERNAL_POWER_ERROR (a0) Observed while running S4 cycling, MODULE_NAME: IntcAudioBus.	4479
1508278473	Audio shows Red X after OOB	4479
18012152690	[TGL][WHM Bypass no detection]	4479
1508171729	"po" noise occurs when play a recording files via internal microphone	4426
1508142746	Sound break occur during when switch to HDMI in mode	4426
1508256437	system occur BSOD 0x7e when connect hook dock and plug in usb device then plug out usb device	4426
14011734961	sound control volume and headset volume not sync when play video/ audio file then adjust volume via usb headset	4426
1508181351	Hear periodically pop noise when pause and resume music for several times	4426
22011199969	F12 LED(mic mute) auto turn off when resume from S4/S5 with usb speaker/headphone plugged	4426
22011296360	SUT will occur BSOD (SYSTEM_PTE_MISUSE) when say "Cortana" (0xDA_IntcOED!COEFwHDAPath::ClearStreamBufferAttributes)	4426
1508253045	System SW Drips value is 0% because of ISST when running the MS test.	4426
1508025837	The progress bar and playing time will keep playing but NOT sound output when plug USB Speaker(Logitech Z105)	4426
14012224968	OED YB during running Alexa stability 5hr testing (DSP communication timeout) with v4329	4426
1508249636	There is abnormal noise when play music and switch audio options	4426
14011648356	Sporadic issue: Sometimes Audio DSP blocks SoI3 entry during modern standby stress tests with audio/video playback in S0.	4382
18012269036	OED YB during Alexa Stability test after the 5hrs	4382
14012155826	Audio glitch when adjusting volume in speaker and headphone path	4382
18012269206	WOV MVA configuration Alexa stops responding to keyphrase	4382
1508153226	On USB offload option disabled in BIOS systems, sometimes DMIC and BT endpoints are lost. Targeting fix in WW33 release.	4329
1508228436	Plug in headphone during play music on Groove, glitch noise heard in headset just after inserting (F/R:1/20)	4329
18012273044	Image would auto fast forward then lag for few seconds after pausing 5-10 seconds and resume playing local 4k/1080HD video	4329
22011189425	Plug in headphone during music playback on Groove application can cause a glitch noise on headset endpoint at beginning ~1s	4295

18012374846	Videolag observed during long hour MP4 video playback with SST v4274 version	4295
22011140343	OED YB during A4PC 24hr stability test with v4257	4274
1707263058	Alexa app handsfree becomes unavailable, Playback and Recording functions are still working during A4PC 24hr stability test with v4257	4274
18012208736	Alexa key phrase is not easy to trigger after running Alexa app for a while.	4274
18012296638	Endpoint device lost during A4PC 24hr stability test with v4257	4274
18012271775	Alexa stop responding to keyphrase in MVA mode	4274
18012227931	Speaker and MIC endpoints are lost after idling for a while, or during running A4PC stability test easily with v4227	4257
18012269036	OED YB during Alexa 24-hr Stability test	4257
18012269051	OED YB during playing music with Groove with v4227	4257
18012188886	OED YB after rebooting and trying to trigger Alexa key phrase with v4211	4227
18012156179	Obvious noise heard from headset when playback on offload pin with v4196	4227
14011937281	Alexa FRR test (silent) not meeting passing criteria	4217
18012164115	Echo/nonecho configuration is not reset in DVD after detection	4217
18011928124	Endless event in Intel Audio Service during WOV tests	4217
1508152660	DMIC FW gain is not taking effect to achieve -26dbfs to pass SPET	4217
18012111736	Failed to SetDx on FW after reboot with Alexa	4196
18012019296	Unit show BSoD(0xca) when reset TWS earphones in Lenovo Bud'dy - fail to match symbolic name on removal and arrival leads to duplicated pdo	4196
18011830255	(HLK)(20H1)General Audio Test fail with 4 subtests Driver has returned zero buffer required on passing null buffer for output buffer which is wrong	4182
1508025837	The progress bar and playing time will keep playing but NOT sound output when plug USB Speaker(Logitech Z105).	4182
22010711979	BSOD 0xC4 occurred after enabling Driver Verifier for HLK testing.	4182
22010926367	Realtek sound wire HW audio codec device driver YB observed while running S5 cycling	4182
18011830429	(HLK)(20H1)PNP Surprise remove test fail with device disappearing during test	4182
22010899747	One "popo" noise occurred at the beginning of the recorded audio file which caught by Internal MIC	4182
22010952274	Unit show BSoD(0xca) when reset TWS earphones - fail to match symbolic name on removal and arrival leads to duplicated pdo	4182
1307730397	[SDW] Unable to enumerate slave after disabling/enabling SoundWire HW Audio Codec Driver	4182
18011402578	(HLK)(TGL)(SDW)(20H1)General Audio Test fail with 7 subtest with error: Error! Could not get KSRTAUDIO_BUFFER: error 145	4182
18012075588	(HLK)(TGL)(BTH)(USB)(I2S)(20H1)Hardware Offload test Fail with 0x8889000f	4182
18012072261	YB on SDW Codec	4182

18012102113	BSOD on jack unplug with ALC711	4182
18012059698	(HLK)(TGL)(USB)(20H1)USB Gneral audio test fail wtih Error " Could not query number of channels"	4182
16011313578	Yellow bang issue noticed for Audio driver while running S3/S4 cycles	4182
18012019965	WOV external update to TGL FF 2.0.668.20_366	4182
22010949851	OED YB while booting up device with Alexa enabled and system hangs at restart logo when rebooting device	4182
1508097735	Alexa AQT FRR test fail in the device playback scenario (Near field)	4182
18011678592	Distortion found with input and output stream through HDA Decoupled Mode(INTEL SST) at 6MHz and 24 Mhz link frequency	4058
14011488015	Audio output Glitches when Enabling all 6 EndPoints with UAOL (2 SB Devices - 2 Output EP, 4 InputEP)	4058
1808704590	HLK - KsTopology Test fail - Updated	4058
18011402578	HLK (SDW)(20H1) - General Audio Test fail with 7 subtest with error: Error! Could not get KSRTAUDIO_BUFFER: error 1450	4058
1508024421	movie & TV pop error message after system plug/unplug USB headset	4058
18011804386	BSOD Bugcheck 10D after key phrase detection	4058
22010754359	System enters into BSOD with the hot-unplug of USB HS when driver verifier is enabled on the system.	4058
18011721199	WOV update to ver. TGL FF 2.0.664.20_344.	4058
18011583006	[UAOL] Glitch on play stop during playback	4058
18011579586	Voice assistant Xiaowei cannot work as HW KWS under MVA	4035
18011696996	Playback (echo reference) data isn't saved in separated channel in WoV dump	4035
18011676841	ISST OED will YB when long run and Alexa stability test	4035
18011614339	Can't run SPET test with TGL SST V3947, "WARNING: speech pin is not available" showed	4035
18011592285	play music will pop error message when system unplug usb headset with SST v3869	4035
18011664260	KsTopology Test fail - Updated - fail to create pin [0x5] ACA with mode	4035
18011615671	Preset parameters (MFX) of 3rd party – post processing can't be loaded	4035
18011559529	ISST device lost after system resume s3/s4 with SST v3947	3984
18011561875	ISST device lost after system resume s3/s4 with SST v3947 - KW fixes	3984
18011560283	ISST device lost after system resume s3/s4 with SST v3947	3984
18011468502	No audio and video lagging when pause and resume playing video with external HDMI	3984
18011423007	play music will pop error message when system unplug usb headset with SST v3869	3984
18011425009	BSOD 0x7e occurred after installing GFX driver with ISST v3869	3984
18011402356	Running UAOL audio playback on 2 SoundBlaster headsets result in distorted audio on one of the headsets	3984
1507960569	BSOD 0x7e occurred after installing GFX driver with ISST v3869	3947

22010538238	OED BSOD when HLK Test - KS position test	3947
18011007672	[BSOD][TGL][HDA][SDW] BSOD Bugcheck=10D while DUT in idle (0x10D_5_VRF_IntcOED!unknown_function)	3947
1808704590	HLK KsTopology Test fail - Updated - invalid pin and more data for proposed format	3947
18011481818	Deadlock when removing device and handling IOCTL simultaneously	3947
1507957414	play music will pop error message when system unplug usb headset with SST v3869	3947
18010772705	Render & capture device keep at headset after removing headset	3947
1507979931	No audio and video lagging when pause and resume playing video with external HDMI	3947
18011069480	SoundWire Frame Solver update to Python3	3847
1507875263	[SDW]Sound volume show 100% as default setting not 67%-Speakers or 17%-Headset	3847
18010773174	Microphone icon detected few times from task bar and sight noise during detection when USB headset plugged in/out.	3769
1507858163	OLED device YB when USB disk plugged.	3769
1808915174	[ADL-S][WoV] DSP communication timeout on OED when trying to register for notification	3709
16010838912	[Client][HDMI] Noise issue of HDMI monitor	3709
1507656800	fix probes on slave core and refactor	3709
14010982771	[Client]Intel SST OED YB when audio jack 3.5mm plugged during playing.	3709
1808759978	[TGL U] A3 Audio DSP Core 0 is up 16.56% of the time during WoV	3223
1808929110	Change wave filter, topology filter and device registry name for SNDW	3223
1806950835	port 4-part ID ICL -> master	3223
1607983846	Repeated Audio loss/breaks are observed in SNDW configuration	3223
1809001292	Add extension inf to audio bus with subsystem id	3223
1808368475	While recording with DMIC above boost level 75, no audio on recorded file	3223
1808462324	[TGL][HDA] Yellow bang code 43 on OED after start playback on BT headset	3223
1507371931	After enabling ISV FW Module in BIOS setting, audio icon will show red x	3223
1808287218	[WoV][TGL] Yellow bang on OED when unregister from notification and register again. lpc message timeout occurred - timeout during WHM initialization	3223